Landscape and Health
The Case of Siping Community in Shanghai

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Abstract
The paper focuses on the existing and current relationship between landscape and health. Today's urban and territorial development programs are strongly influenced by the main global changes related to climate, environment, technology and demography. WHO, over the years, has elaborated precise indications regarding these issues and the echo of certain successes has recently reached countries such as China, where attention to health is placed at the top of government. Urbanization is important that considers these variables globally to offer greener, safer and healthier urban spaces, adapting local cultural diversity and promoting social inclusion. Moreover, if the experimentation of new tools will not be available to handle the upcoming changes, they will end up hindering the improvement of life quality of millions of people. Against this background, authors intend to present an accurate analysis, combining and comparing information on the levels that constitute the landscape element of a specific reality chosen from Shanghai city and assessing its different aspects in relation to the health factor. This classification is followed by the definition of an urban solution, considered standard, which provides directions for the development of a healthier urban context.

Introduction
WHO defines a healthy city as "one that is continually developing those public policies and creating those physical and social environments which enable its people to mutually support each other in carrying out all functions of life and achieving their full potential"[1]. Healthy City constitutes a process and not a condition; therefore, it means that potentially any city or community can be considered healthy, regardless of its current state of health.
In 2018, the WHO European Healthy Cities Network gained 30 years of activity, during which it intensively promoted programs that aimed at the widespread dissemination of new and healthy lifestyles, capable of concretely modifying urban settings and finalized to the achievement of specific objectives through five-year goals definition. So far, the Network involves more than 100 cities and 30 nations, for a total of 1400 municipalities[2] and numerous positive experiences.
Nowadays in China, Health topic is getting more and more attention in relation to sustainable development that has replaced the pursuit of economic growth at any cost. Moreover, this Country is struggling with cities' problematics that Europe or North America have already faced during previous decades. On one hand, the urban sprawl and car-dominated transportation have caused a significant increase of air pollution, road injuries, sedentary life-styles and NCDs diseases; on the other, the attention from the public health authorities was focused mainly on the direct causes of the diseases rather than on the urban environment or the underlying human conditions[3]. It has to be noticed that living healthy and in harmony with the environment represent issues with a long history, fundamental parts of the basic principles of traditional Chinese medicine. Such concepts, as for example carrying out regular activities

Figure 1. Location of Siping Community. Source: Authors.

during the day (rest, diet, exercise) and the control and management of the possible negative effects deriving from environmental factors (e.g. Fengshui) are determining elements of Chinese culture; and these concepts have much in common with the guidelines for healthy lifestyles promoted by WHO[4].

Beyond this, current data confirm that by 2030 the rate of urbanization in China will reach 70 percent[5], so the challenges for improving the level of urban health are destined to increase and expand. This is also supported by the fact that, despite it is consistent the actual progress made by Chinese cities to address the urban health problems, the health sector alone does not have enough resources for solving the modern complexities on this matter.

The approaching transition towards an ecocivilisation, as mentioned by President Xi Jinping in 2013, is well highlighted by the Healthy China 2030 plan that was adopted in 2016[6] and proposed as a series of guiding principles fostering citizens' health for the next 15 years. In particular, HC 2030 identifies 13 main indicators[7], to assess, among the other main goals, the level of environmental health (2 indicators) related to good air quality rate and the rate of surface water quality.

As declared from many studies, green spaces have numerous environmental and ecological advantages, being able to influence local climate conditions, to mitigate the effect of urban heat islands[8] and also to collaborate for CO_2 sequestration[9] by integrating the use of different trees and plants. Furthermore, today green spaces often turn out to be the only means by which to have contact with nature within the built environment. Hence, starting from the classic definition of Healthy City and focusing on the relation between humans and environment, authors intend to investigate what are the contemporary characteristics that determine the level and type of healthiness of urban contexts, specifically in terms of landscape and urban green space for the local community, to promote well-being among people. This reality is particularly interesting from the point of view of urban, spatial and social relationships, presupposing an accurate study of multiple factors that interact simultaneously to generate a multi-faceted organism that lends itself well to the evaluation criteria of Healthy City. In particular, through the analysis of one case study in Shanghai, the paper aims to:

- Define how the study of urban structure and design approach work together to improve urban health;
- Define directions for the development of the characteristics of a healthy urban context.

Study Area

Siping community is located in the Midwest part of Yangpu District in Shanghai, occupying an area of 2.75 km2, counting 23 neighborhood committees and 70 natural communities, with a total population of over a hundred thousand (Fig. 1). First settlements in this area date back to the early 1930s, represented by "natural villages". In 1946, Tongji University found its collation again in Shanghai and Siping Campus was established along the homonymous main road, Siping Road, which, thanks to subsequent enlargements, will provide a distinctive character within the Community. After the founding of the People's Republic of China, in 1949, Siping Community went through several phases. The villages resisted until around 1954 when they began to be demolished and in their place, the first public housing were built.

Certainly, the advent of the great Cultural Revolution that took place between 1966 and 1976 was important, followed by a period of reforms and openings starting in 1978 and culminating in the 1990s when all the remaining “natural villages” were eliminated and the lots were occupied by high-rise construction. Essentially the current Siping Community is the result of a history of construction that has generated, over the years, a sophisticated local life network and a precious cultural heritage that need to be improved[10].

Landscape Mapping

Taking into account the official document about the Urban Green Space Classification (CJJ/T85-2017)[11] in China, and making an assessment coherent with the community scale, Siping area is characterized by several layers that, if overlapped, constitute the whole landscape. Fieldworks and an in-depth analysis has been conducted by the authors involving twenty-three Master students of Tongji University who attended the "Environmental Design Studio" as part of the "Shanghai Design Joint Studio" platform promoted by Tongji University in collaboration with other academic institutions. Research was carried out thanks to different methods including on-site observations, documentation, photos survey, preliminary sketches, interviews together with the subsequent processing and post production data phase using dedicated professional software. The different levels are divided in the following way (Fig. 2):

- **Waterfront Landscape**. This level defines urban spaces that interact with water element in various forms (river, short stream, small body of water, etc.);
- **Playground Landscape**. It refers to the identification and classification of the various sports facilities existing in the Community;
- **Strip Landscape**. The function and distribution of the space for this level are linear and consider elements that are usually placed alongside roads or waterways;
- **Point Landscape**. This layer puts together a series of landscape components, of limited dimensions, which define accurately the urban space and to which a precise function has been assigned;
- **Block Landscape**. Authors intend to identify, at a larger scale, how the presence of Siping Campus and other main venues delimit the urban fabric;
- **Tree Rows along Streets**. The analysis concerns the different species of trees that grow along public roads and water elements within Siping Community.

Starting from the “Waterfront Landscape” typology, we find Yangshu Pu Gang River, which laps the Southeast side of the community and another water system within the Tongji campus. It includes a short watercourse, Tongxinhe River, and two areas designed according to the examples of classical Chinese gardens (San Hao Wu Park and Wen Yuan Garden) therefore close to a small body of water. Evaluating the level "Playground Landscape" are scattered, especially West of Siping Road, several tennis courts, football fields, basketball courts, and even a swimming pool that is part of Tongji Campus; east of Siping Road, instead, along Sujiatun Road and Fushun Road, there are exercise trials.

With regard to the "Strip Landscape" type, the scale is now more general and when users interact with this urban space, they mostly use it in the direction of the main axis. In detail, in Siping Community there are 2 pocket parks, 4 recreational zones and one area along a small waterway previously described for the level "Waterfront Landscape" (Wen Yuan Garden). Considering the elements from “Point Landscape” level, the scale is relatively small and the function is exclusive, usually identifying clear themes and spatial forms. From the field

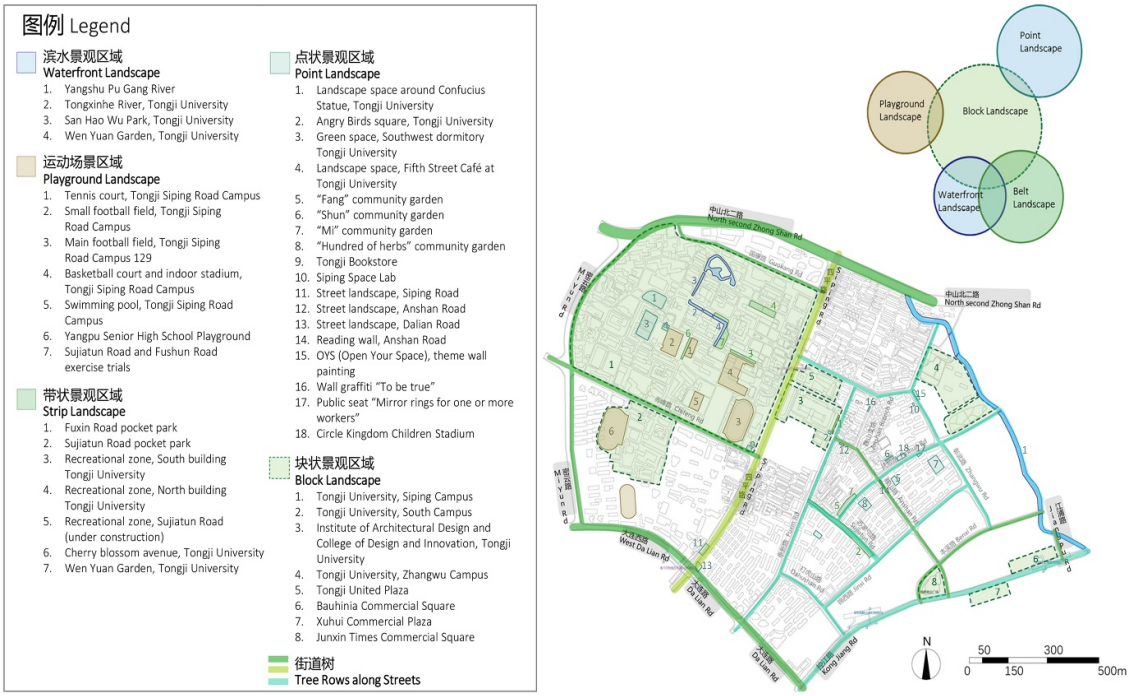

Figure 2. Landscape mapping analysis of Siping Community. Source: Drawing by Yun Yunxin, Zhao Yang, Zheng Chunmei, Zhou Shijiang, Specialized Design Project - Environmental Design Studio, College of Design and Innovation, Tongji University. Modified by Authors.

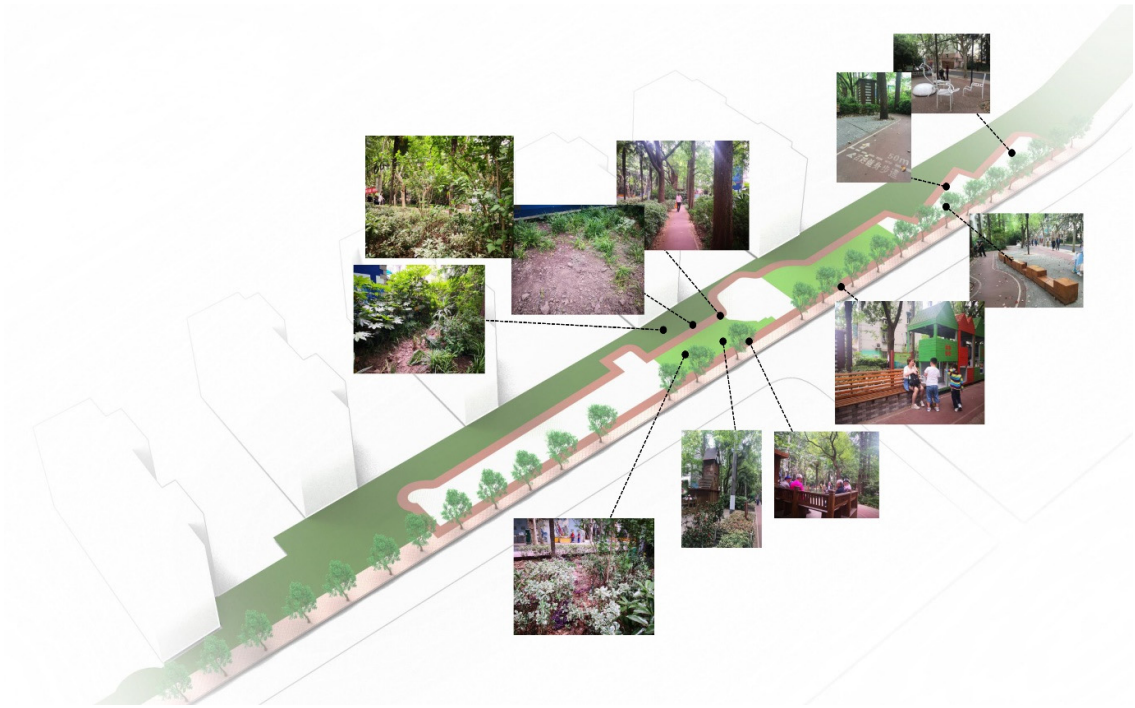

Figure 3. Sujiatun Green Space. Source: Drawing by Yun Yunxin, Zhao Yang, Zheng Chunmei, Zhou Shijiang, Specialized Design Project - Environmental Design Studio, College of Design and Innovation, Tongji University. Modified by Authors.

study, students have detected 4 recreational landscape spaces, 4 community gardens, 2 indoor cultural spaces, 7 recreational street spaces and 1 playground for children. "Block Landscape" defines wide areas that accommodate multiple functions and circumscribe recognizable portions within Siping (especially in the Northwest area) generating reference points for the entire Community and any other users; additional landscape spots are included internally. In particular, 4 universities and research areas and 4 commercial areas were listed.

Finally, students identified the main trees species. Along the streets of Siping Community, we can recognize Ginkgo Biloba Linn, Buxus Sinica, Cinnamomum Camphora, Platanus Orientalis, which is by far the most widespread, and Salix Babylonica that can be found mainly along the banks of the Yangshu Pu Gang River.

Defining Standard Model to Improve Urban Health: Sujiatun Green Space

The previous landscape mapping demonstrates how Siping Community owns several elements, which acting simultaneously, are able to enhance the well-being and health of the local inhabitants, giving the opportunity to relax, create new social networks, practice sports and therefore generally improve their life quality level. Achieving certain objectives clearly depends on factors that are intrinsic to the space analyzed, i.e. the design, accessibility, biodiversity and infrastructure and others that are directly connected to the area in which they are located.

Based on this, the research group work focused on a specific site within Siping Community, Sujiatun Green Space (included in "Strip Landscape" level, see Fig. 2). This area is located along Sujiatun Road, a one-way branch of Siping Road with a length of about 380 meters (Fig. 3).

Sujiatun Green Space constitutes the largest public area for residents considering an 800-meters radius of interaction; here the vegetation mainly includes green plants such as Metasequoia, Camphor, Boxwood, and evergreen plants. It is a public leisure space, providing several activities and people enjoy it as a place where to gather. However, the maintenance of the area is poor and consequently the visual and physical impact is not completely satisfactory; moreover, the missing variety of plants causes redundancy and monotony.

This urban space needs an improvement that allows a positive activation of residents' daily life and of communication among them. For this purpose, it is considered just a part of it extending for 460 m2. Based on similar recent pilot projects carried out in the Campus area, a "Standard urban section" has been defined for the case study. In particular, this section analyzes what has been achieved for the urban green space located behind the South Building of Tongji University.

The reference section is essentially divided into two parts (Fig. 4): the first corresponds to the width of the sidewalk along which there are rows of Platanus Orientalis Linn that help in providing shade along the street; the second part corresponds to the actual urban green space. Here, through a precise mix of plants and flowers, which alternate along a path parallel to that of the sidewalk, a sort of "urban forest" is created where people have the opportunity to learn notions about the vegetation and take a break from the built urban space that is located immediately next to it.

The precise path, made by gravel, developing in an organic way and being enhanced by the presence of different floral varieties, transforms this urban green space into a well recognizable spot within the Community: a place that creates an interactive link between city-users and environment.

The selected plants vary in height and size to create a nice mix, and some have particular foliage with different colors to make them visually attractive. Speaking of senses, in addition to sight also the sense of smell has been considered to generate curiosity and interest; even if the bloom is seasonal, some plants have flowers that can survive for a longer period and have smell of vanilla.

Conclusions

The presented "Standard urban section" model fits perfectly into the urban fabric of Siping Community that incorporates it and assigns it a particular character and function in relation to the landscape mapping methodology while improving the urban health of the area. Furthermore, it adopts and puts into practice the directives provided for the Shanghai Urban Master Plan, which was approved in 2017, with reference to Yangpu district to which Siping Community belongs. Connected to this, the "Standard urban section" is defined by virtue of

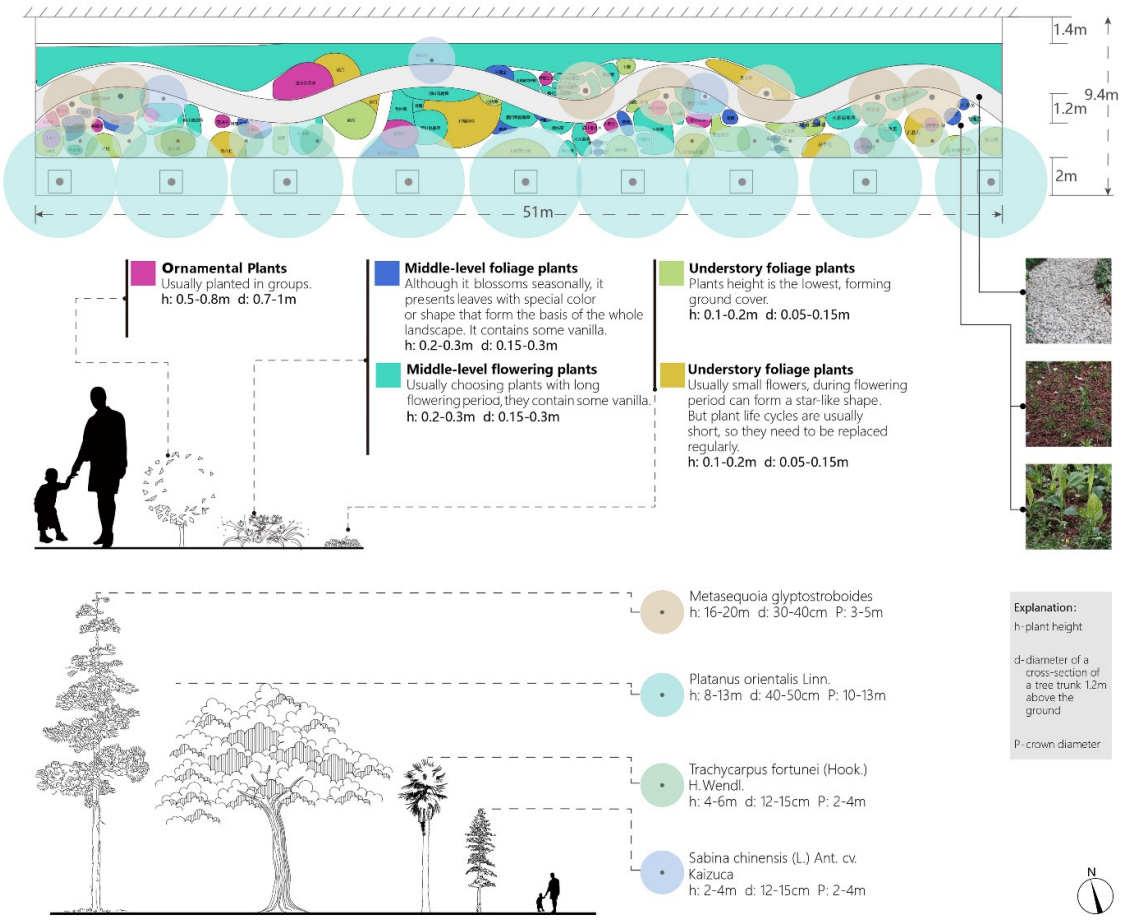

Figure 4. “Standard urban section” based on pilot project at Tongji University. Source: Drawing by Yun Yunxin, Zhao Yang, Zheng Chunmei, Zhou Shijiang, Specialized Design Project - Environmental Design Studio, College of Design and Innovation, Tongji University. Modified by Authors.

its basic approach that can be taken into consideration for other cases, but it must be adapted each time to the new context (e.g. Shanghai different districts).

Nevertheless, there is awareness of the need for further studies that can validate, through quantitative and not only qualitative measurements, the positive effects, both physically and mentally, that derive from the application of the solution in relation to the health factor.

The great challenge that many densely populated cities are facing now, as is the case of Shanghai, is that, over years, environments, designed and built for everyday life and work, present more risks for our health rather than benefits. It is therefore necessary to take a step back and re-evaluate what theory and culture have handed down during history with respect to the concept of healthy landscape and to try to reintegrate this element, enhancing it and making it essential for those who will exploit it.

Acknowledgments

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Endnotes

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